ELECTRICITY on the FARM

The National Magazine of Rural Electrification

THIS MONTH—

Latest in Farm Freezer Design
An Efficient Home Dehydrator
Protect Your Motor—Here's How
Our Milk Cooler Works for War
Pointers on Hoisting Hay
Butter Making at Home
Preparing Foods for Drying
Use of the Kitchen Mixer
Answers to Reader's Questions

MAY, 1943

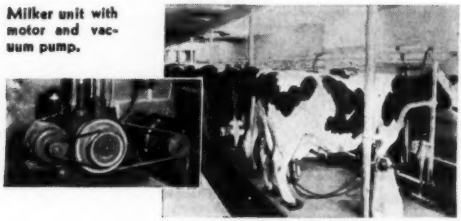
OREGON STATE COLLEGE

A CASE – SHEPPERD – MANN PUBLICATION

HERE'S HOW TO KEEP YOUR "WIRED HANDS" FIT

Your Milker

Keeping all parts of your milker unit clean is one of the best ways to avoid breakdown. It should be installed in a clean, dry place away from the dust of hay and feed; if necessary, relocate it. Keep motor properly lubricated. Frequently check the oil level in the pump and change oil every month. Keep belt aligned and at proper tension. Clean vacuum hose regularly to prevent plugging or collapse. Rinse teat cups and other rubber parts in cold water, or wash immediately after using. Alternate two sets of teat cups weekly; this will increase their service period around 30 per cent. In case of breakdown do not attempt to repair unit—call a trained service man.



Milker unit with motor and vacuum pump.

Your Milk Cooler

If possible locate motor and condenser in a room of their own. It is important that they be kept clean. Clean condenser coils frequently. If the unit is not cooling properly, or if there is anything unusual about its operation, do not attempt to repair it. It needs the care of an experienced service man.

Your Water System

Guard against trouble by making regular inspections. Lubricate motor, and check belt. Drain pump oil at least once a year, and refill; SAE 20 is excellent for this purpose. Check packing box every two months; if there is leakage tighten nut while pump is running. A slight leakage, about two or three drops per minute, is necessary however, as this releases tension on the piston and lubricates the rod. To keep shallow-buried pipes from freezing, wrap with soil-heating cable, or pile hay or sawdust over them. Allow spigots to trickle in extremely cold weather.

All Rubber Parts

Keep all rubber parts clean; be particularly careful with butterfats, which cause deterioration. Use care in handling—rubber cuts easily when wet. Do not use chlorine solution stronger than one teaspoon in five gallons. If lye is used in the care of rubber, keep it away from the metal, which it corrodes.

Cleaning refrigerator unit with air-blower. A standard vacuum cleaner can also be used.

Before calling a service man, check to see if you can locate the trouble. It may save him extra trips, and will save you expense. Ask your County Agent or the farm representative of your electric company for advice and help in maintaining your equipment for the duration. *General Electric, Schenectady, N. Y.*

GENERAL ELECTRIC

308-10M-155

I've Got My Eye on a NEW FREEDOM KITCHEN!

WE TALKED IT OVER around the kitchen table last night—and decided to buy still more War Bonds for two reasons. First, we want to help end the war more quickly. Second, we want a new Hotpoint Electric Kitchen for our farm—and our War Bond savings from our crops will help buy it when Hotpoint can stop making war materials and start producing those wonder-working electric appliances again. Edison General Electric Appliance Co., Inc., 5610 W. Taylor St., Chicago, Illinois.

—and WAR BONDS Will Help Us Own It!

ORIOLE FARM KITCHEN

This convenient, spacious farm kitchen equipped with Hotpoint Electric Range, Refrigerator, Electric Dishwasher, Sink and Hotpoint Steel Cabinets will cut your kitchen time in half—give more freedom for other duties.

The average cost of a Hotpoint Electric Farm Kitchen is no more than the pre-war cost of a popular priced automobile.

BUY WAR BONDS TODAY—
an Electric Kitchen Tomorrow!

ELECTRIC **Hotpoint** KITCHENS

Editor's Chat

HOME DEHYDRATION

In this issue we have an article on a home dehydrator. It is scientifically designed, and we believe one of the best for home use. There is also an article on preparing foods for drying. The fact that we have printed these and other articles does not mean that we are "all hopped up" over home dehydration. We are not. Here is our honest opinion in the matter.

Dehydration of foods is largely a wartime enterprise to save weight and volume in shipping, and to save foods which could not otherwise be preserved because of lack of sugar, cans, rubber rings, etc. On a commercial and community scale, dehydration of some foods will probably be continued after the war. As a home enterprise, dehydration will go with the cannons at the end of the war. This is why we think so.

There is as much or more work in preparing foods for drying as for canning, and much more than for freezing. Slicing and blanching takes time and fuel. The best of home dehydrators are not foolproof. Their use for different foods must be learned. You will have some half-good results. Proper packaging must be done to avoid spoilage in different climates, loss of vitamins and food values. Preparation for eating is slower than with canned or frozen foods. With possibly a few exceptions dried foods cannot compare in palatability and flavor with the same foods frozen or canned.

Make the best use you can of your dehydrator now. It is wartime equipment.

FARM FREEZERS

A few freezing cabinets of small and large sizes are still available in local stocks in the United States; but very few. Ice-cream manufacturers whose output has been limited are getting back used ice-cream cabinets from local stores. They serve reasonably well as small frozen food "lockers." A limited number of farmers will be able to get small refrigeration machines and materials for building farm freezers. To them, and until they are again able to buy finished cabinets which they may like better, we recommend Prof. Montfort's design in this issue. It is well engineered. We believe it will influence post-war designs.

GLOBE TROTTERS

A few years back, "globe trotters" or much traveled persons were either individuals of wealth, tramps or guys who bumped around trying to make a catch-as-catch-can living. Not so today. The widely traveled man of today wears a uniform.

On the train today, I have been chatting with a Second Lieutenant from Maine. He trained in New Jersey, Florida and at several western air fields. Now, after five months in the South Sea Islands he has flown back via Hawaii, San Francisco, and Texas, and because of bad weather is enroute to New York by train, on leave. He thinks he may be sent to Europe. An Oregon farm boy whom I met in the Station in Washington had been trained in the South and East. He was in the first attack force in North Africa. Covered with burns, wounds, medals and smiles, he was headed back to "the little wife and baby" in Oregon, then to a new assignment. Boys from our community who have been in the service only two months have been in three training centers and have crossed the entire United States. Some had scarcely been away from home before.

Travel is broadening; it is an education. When this war is over, we as a nation may not have money or much credit left, but we will have millions of men who have traveled widely over the whole world. They will have seen how other peoples live and die. They will know better how to get along with people of other nationalities. We will have an investment in men which should maintain us as a leading nation. If, after these experiences and contacts, the boys are anxious to get HOME and stay at home, it is up to us to preserve for them those things which make this country such a grand place to come back to.

MADAM CHIANG

If knowledge of world affairs and world history, courage, perseverance in spite of handicaps, clear thinking and poise amidst confusion and acclaim, ability to command confidence and admiration in foreign lands, simplicity, forceful speech and a humble Christian spirit are qualities needed at the World Peace and Reconstruction table, we nominate Madam Chiang.

Geo. W. Kable

ELECTRICITY ON THE FARM
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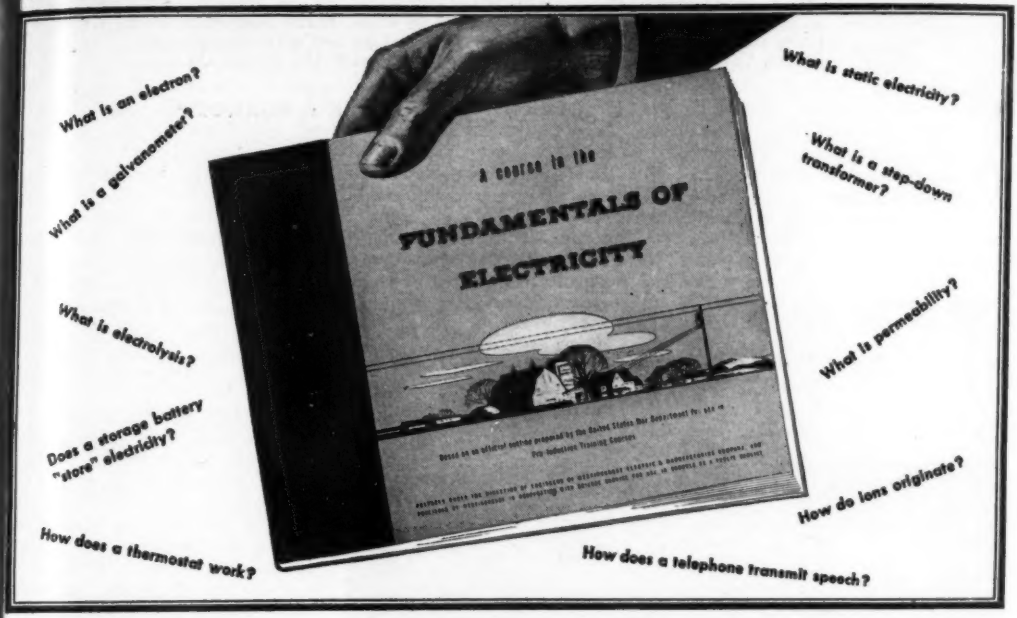
★ WARTIME STRATEGY ON THE FARM ★


What is an electron?
What is a galvanometer?
What is electrolysis?
Does a storage battery "store" electricity?
How does a thermostat work?
A course in the
FUNDAMENTALS OF ELECTRICITY
What is static electricity?
What is a step-down transformer?
What is permeability?
How do ions originate?
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Contents of "Fundamentals of Electricity"

LESSON	LESSON	LESSON
1. Magnetism Explained	14. The Electric Battery Cell	28. Motion, Force and Work
2. The Magnetic Field	15. Volta's Pile and Battery	29. Energy and its Forms
3. The Earth A Magnet	16. Steady Battery Current	30. Time and Power
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THE LATEST IN FARM FREEZER DESIGN

A 35 Cu Ft Freezer Cabinet to Operate at 5° in Texas Temperatures with a Quarter Horsepower Compressor Unit and with Enough Stored Cold to Stay Frozen for Several Days with the Power Off

By P. T. MONTFORT*

IN the Spring of 1942, agricultural engineers at the Texas A & M College designed, built, and placed under test, a farm freezer chest incorporating many desirable features. They were primarily interested in building a unit which would provide satisfactory operation, even during the long periods of relatively high temperatures which occur each year throughout the South and Southwest. With minor changes, this basic design should operate satisfactorily in any section of the country.

The primary objectives in designing this freezer chest were:

1. It should have sufficient freezing and storage capacity for the average farm family.
2. It must be low in first cost—consistent with low depreciation and up-keep.
3. It must be simple to build.
4. It must be simple to operate.
5. It must be low in operating cost.

The Refrigerator Box

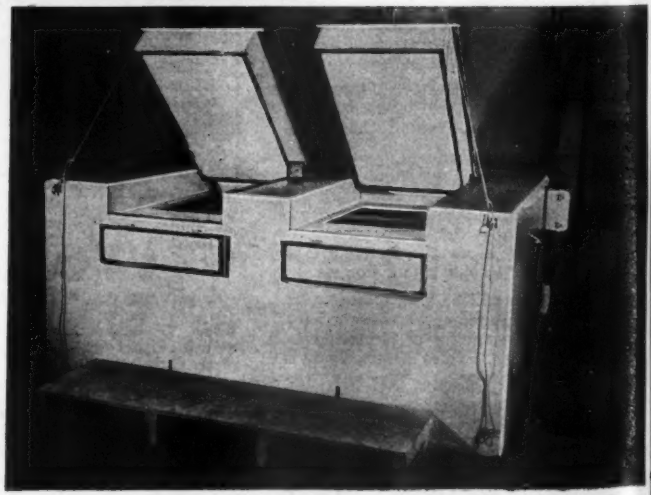
The first thing to be decided was the size of box which would meet the needs of the largest number of farms. This was a difficult question because conditions vary so widely on individual farms.

After talking with a number of farmers who were using freezer chests and locker storage, and after a thorough study of the investigations made in other sections of the country, it appeared that a box with a net storage space of somewhere between 25 and 35 cu ft would meet the needs of a large majority of farm families.

The final plans provided a gross capacity of approximately 45 cu ft. Allowing for refrigeration coils and equipment, the net storage space was 35 cu ft. This will hold 750 to 800 pounds of

*Mr. Montfort is Agricultural Engineer and Rural Electrification Specialist at Texas A. & M. College, College Station, Texas.

Above: The completed farm freezer. It is 8'-1" long, 41" high and 5'-1" wide. It has 9½" of insulation on sides, ends and bottom, and 5½" in the top. The inside dimensions are 24¼" x 40¼" x 76½". The cabinet is best made of ½" plywood, the inside box of ¼" moisture proof plywood. Matched lumber could be used. If available, a galvanized bottom could be used in the food compartment. In use there has been little difficulty with moisture in the box, even when defrosting, as the frost can be mopped up with a cloth.



Right: The top doors and the hinged air-seal doors on the front are opened in this view to show the gaskets around the edges of the doors. The black strips are rubber covered weather stripping or refrigerator gaskets. Note the ropes and the hooks on the cabinet to hold the doors open. The platform in front is for convenience in reaching into the box. The ¼ hp refrigeration unit is on the floor at the end of the box.

frozen products in wire baskets or other small containers for ease in handling. If placed loosely in the box without wire baskets, it will hold 1200 or more pounds.

The next question was whether to include a separate freezing compartment. Experiments conducted by the United States Department of Agriculture and other agencies indicate that the faster a product is frozen the better will be the quality at the end of the storage period. Limited experience with freezers under farm conditions and having small compartments operated at a temperature 10° below the storage compartment indicates very little difference in the quality of the products. Since the inclusion of a low temperature compartment complicates the construction, increases the cost, and makes the operation more complicated, it was decided to omit this feature in favor of a single temperature freezing and storage cabinet to be operated at 0°F to —5°F.

Materials Carefully Selected

The materials to be used in the box received careful consideration. Moisture proof plywood was chosen for both inside and outside walls because of its strength in relation to weight and the ease with which it could be fabricated. Since the plywood is available in a wide range of sheet sizes cut to exact dimensions with square corners, it was relatively simple to work out the box dimensions so that there would be very little sawing to do and practically no waste material.

The framing is standard 1" lumber.

The insulation for the box is most important both as regards the character of the material and the amount used. There are a number of excellent insulating materials available in either sheet, bat, or loose form. As a rule, the loose or "fill" insulations are the least expensive and if properly installed will give satisfactory results. Fiberglass in the loose bat form was selected because it was available at the local lumber yard, is easy to install, inexpensive, and possesses most of the desirable characteristics of a good insulator.

With insulation of the loose type, it was extremely important that the outside wall of the chest be made vapor-proof to prevent the insulation from becoming waterlogged. This was accomplished by coating the inside surface of the outside wall with odorless liquid *refrigerator asphalt* and immediately applying a layer of Sisalkraft paper before nailing it to the framing.

The thickness of the insulation has an important bearing on the first cost of the box, the size of compressor needed, and the operating cost. The equivalent of six inches of sheet cork insulation is generally recognized as the desirable thickness for refrigerators to be operated at 0°F temperature. We found, however, that under temperature conditions in Central Texas (72°F mean annual temperature) that by increasing this thickness to ten inches in the walls and floor of the chest, we could use one size smaller compressor. The estimated saving in operating cost would offset the extra cost of construction in less than one and one-half years.

The box was built in six separate sections—bottom, top, front, back, and ends. These were assembled and fastened together with screws. One-eighth inch felt strips coated on both sides with liquid asphalt were used to seal the joints.

The outside of the box was finished with two coats of flat white paint and two coats of a good grade of enamel. The inside walls were finished with a special *odorless paint* such as is ordinarily used in locker plants and other low temperature storage buildings.

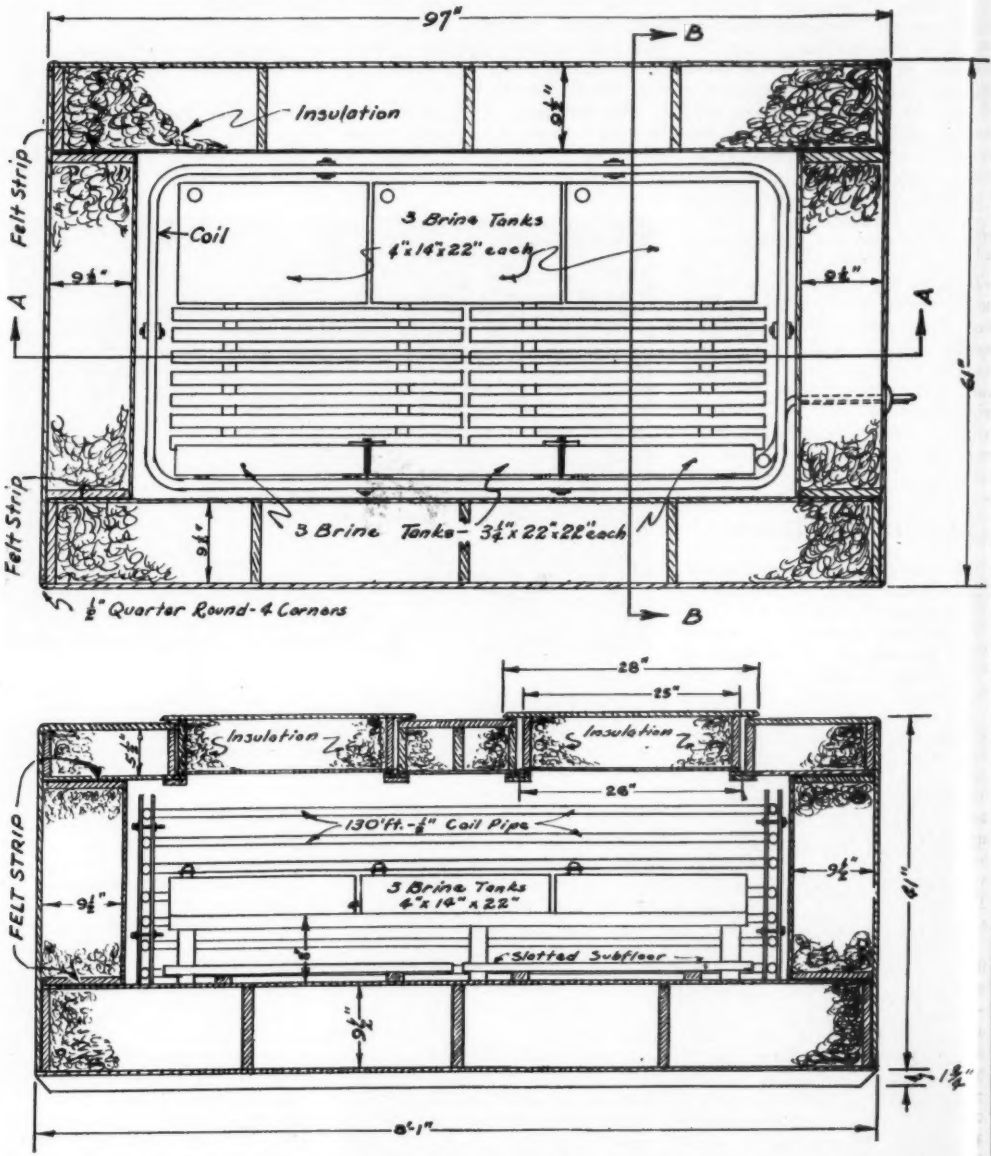
Refrigeration Equipment

The cooling coils inside the box involve two features not ordinarily found in refrigerators of this type. The first was the use of ordinary black steel pipe in the cooling coil itself, instead of the conventional copper tubing, fin-type, or plate-type coils. A box-type coil of 130′ of ½" black pipe was shaped to fit just inside the walls of the chest, similar to the arrangement in some tank-type milk coolers. This coil was fabricated with welded joints in the shops of an industrial refrigeration coil manufacturer to be sure that there would be no air leaks and that the inside of the coil would be thoroughly cleaned before being placed in service. The primary reason for using this type of coil was the lower cost plus the fact that the other types of coils using copper and strategic

Looking down into the storage compartment from the front. The refrigerant coils around the outside are supported in metal racks. Each brine tank holds about 5 gallons of salt brine, which acts as a cold reservoir. The tanks serve as shelves on which foods may be placed for freezing. The brine freezes at 6° below zero.

materials were becoming difficult to obtain.

The other unusual feature is the use of removable brine tanks placed inside the chest to store up refrigeration. Six tanks with a total capacity of 325 pounds of brine were used. Three of these tanks were placed along the front wall of the chest with ¾" space between the tanks and the coil, and with a 1" space at the bottom and top to provide air circulation. The other three were laid flat on a shelf along the back of the box



Above: A cross-section of the cabinet looking down from the top. It shows how the ends and sides are each built as separate units and then fitted together with asphalted felt strips between the sections. The coils are 2" in from the walls. The location of the six brine tanks for storing cold is shown. The slatted floor permits air circulation around the foods. **Below:** If in the plan above, the box were cut in two on the line AA and you looked at it in the direction the arrows point, you would see the vertical cross-section below. It shows the construction of the bottom and top sections and placing of the coils and brine tanks.

approximately 10" above the floor. Products to be frozen may be laid flat on this shelf to increase the speed of freezing.

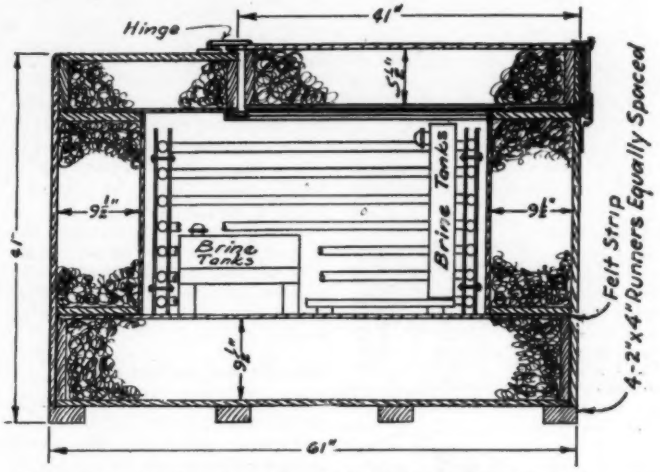
The brine used in these tanks is a 23% solution (23 lbs. to 12 gallons) of ordinary salt in water. This solution freezes at —6°F. Each pound of the frozen solution will take up 108 Btu of heat in melting from a solid to a liquid at —6°F. Each pound of the frozen solution will in melting take up approximately as much heat as is removed from one pound of beef in cooling from 50°F to 0°F.

Brine Tanks Reduce Compressor Size

The purpose in incorporating the brine tanks was two-fold. One was to provide stored refrigeration to speed up the freezing process when large quantities of warm products are placed in the refrigerator. The brine tanks by helping to handle the peak loads make it possible to use a smaller compressor than would otherwise be needed. A standard ¼ hp compressor on this chest, with the brine tanks, has sufficient capacity to take care of the heat leakage into the box and freeze 325 pounds of beef in eighteen hours with the outside temperature at 100°F. Without the brine tanks, a ¾ hp compressor would be needed.

The other purpose of the brine tanks is to provide protection in the case of power outage or equipment failure. One statement frequently made by the prospective users of farm freezing and storage equipment is: "What is going to happen if the power goes off or my refrigerator breaks down?" The use of brine tanks should eliminate this apprehension.

A "holdover" test was made on the box by reducing the temperature at the center of the chest to —11°F then the power was cut off. Both recording and indicating thermometers were in the box. The temperature of the room in which the box was located was maintained uniformly at 82°F. The doors to the box were left closed. One hundred thirty hours (5 days, 10 hours) elapsed before the temperature in the center of the box rose to 32°F. When the test was repeated without the brine tanks, the temperature at the center of the box rose to 32° in 14½ hours. If the brine tanks were to be used for protection only, the size of the tanks might well be reduced to one-half the present size—thus providing approximately 2½ cu. ft. additional storage space. However, this reduction in size of the brine tanks would require the use of a larger compressor to take care of times when large quantities of products are being frozen.



Cross-section elevation from the end, looking in the direction of the arrows BB shown in the top view. Note the door construction and how sections are put together. Insulation serves best when not packed tight enough to crush it. It must be placed, however, so it will not settle and leave open places at the top. Insulation in bats, which hold their shape, is good. (Error: The height at left should be 43" instead of 41" to bottom of runner.)

Brine Frozen at —6° F.

The freezing point of the brine solution is —6°. The controls on the compressor are set so as to maintain a slightly lower temperature surrounding the tanks. This will prevent a portion of the brine melting during the "off" cycle of the compressor in normal operation. A thermostat with a minimum differential between the cut-in and cut-out of 4°F was set to maintain an average temperature of —5°F at the center of the box. The brine tanks, located nearer to the coils, are four to five degrees colder.

A standard ¼ hp air cooled refrigeration unit is used to cool the box. A thermostat with the bulb located in the air inside the box and the adjustment outside the box is used to control the operation of the motor. A thermostatic expansion valve regulates the flow of refrigerant into the coils. Auxiliary equipment in the refrigeration system includes a heat exchanger, and a refrigerant drier unit.

The total cost of materials and equipment including the compressor unit was $261.85. This was on the basis of list, or retail, prices. The cost of labor was not included, but should not exceed $50.00 if the box is built on the farm with the aid of a local carpenter. The compressor unit cost $125, installed.

Operating records over a period of six months, under controlled laboratory conditions, indicate that under farm conditions in the southern section of the country, the use of electricity should not exceed 90 kwh per month on a year-round basis.

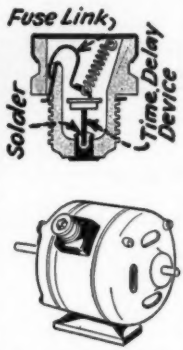
Plywood has come into its many new uses because of modern synthetic resin glues, and impregnating and densifying compounds, which make it practically a new product.

Protect Your Motor; It Cannot Be Replaced

Part 2 of Article on Safeguards for Wiring Systems and Motors. The Cause of Motor Burnouts; How Motors Are Protected; Protection Devices.

By GEO. W. KABLE

MOTORS burn out because the wires inside them are overheated from carrying excessive currents or from lack of ventilation to cool the windings. Excessive currents are usually due to overloads, and overloads have many causes.



Above: Cutaway illustration of a Fustat showing the fuse in the upper part which blows on short circuits and the time-delay thermal unit below which "lets go" on long overloads or when the unit gets hot from any other cause, such as being mounted in the housing of a motor which overheats from lack of ventilation. **Below:** Mounting a Fustat on the motor case is a shop job, as it requires making a hole through the case and drilling and tapping screw holes.

Some of the common causes of motor overloads are (1) failure to oil the motor bearings; (2) too much oil causing a breakdown of insulation or an accumulation of oily dirt; (3) tight bearings or failure to oil the driven machine; (4) driven machine out of line or in bad repair; (5) belt too tight; (6) pump or water pipe frozen; (7) crowding a machine beyond its intended capacity. One should remember that a motor is not like some men. The more you load it, the harder it will work until it burns its "heart" out.

Excessive heating is also caused at times by low voltage at the motor. Motors are designed to operate at certain voltages. If by using feed wires that are too small or too long for their size, or for any other reason the voltage is low, the motor will try to run but the current will increase and the motor will get hot. Some motors starting under load and at low voltage may not come up to rated speed, and the starting winding will become very hot.

Other causes of heating are dirt in and around the motor which does not permit the heat to be dissipated; or covering or housing the motor so closely that ventilation is stopped.

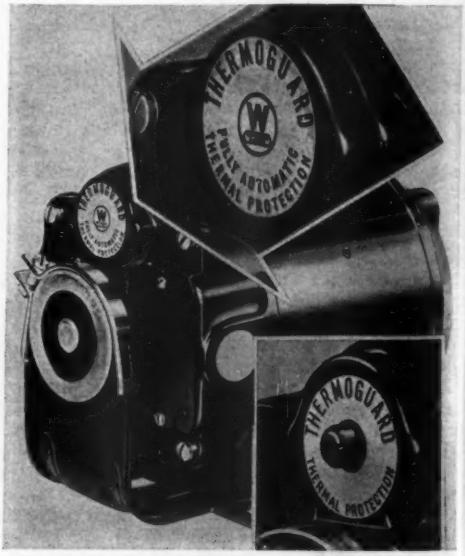
Fuses Do Not Protect Motors

Circuit fuses or circuit breakers protect the wire of the circuit from overheating, but they do not protect a motor. This is why. A motor in starting uses four to six times the amount of current it uses in running fully loaded. The circuit protection must be heavy enough to carry this starting current with any other load that may be on the circuit. That is, the circuit fuse must carry about 500 percent of the normal running load on the motor. But, a motor, if continuously overloaded as much as 100 percent will eventually burn out. Therefore, the circuit fuse does not protect it.

For the same reason a fuse will not protect a motor even if installed right at the motor. It must carry the starting load and will not safeguard the motor under its running load. A different kind of protective device is needed.

A motor protection device may be a Fustat, a thermal breaker or a magnetic breaker. The first two were described in Part 1 on cir-

Thermal overload switch which may be built into a small motor at a cost of less than a dollar. This type closes the switch automatically when the motor cools. It protects from overload and other heating.



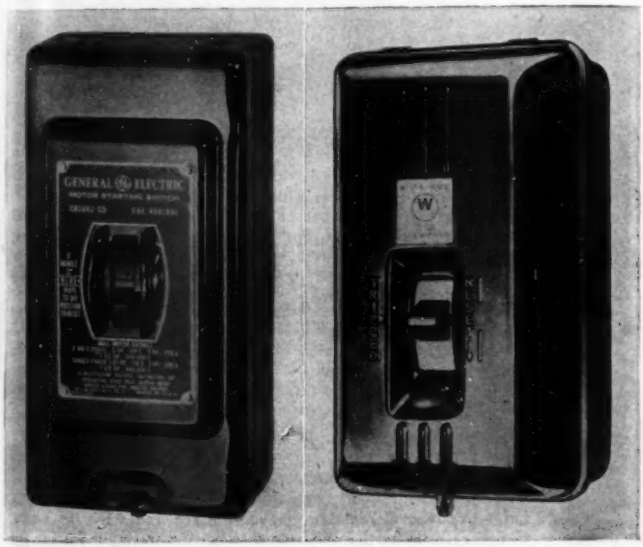
Two types of Thermoguards and a view showing how they are built into the motor. They protect from both overloads and other heating. At top is an automatic resetting unit; below is a hand reset unit. The hand reset unit is the one which should be used on the farm, as it is seldom one wants a motor to start by itself. After an overload, the cause should be corrected and some one should be on hand to restart the motor.

cuit protection. All of them consist essentially of two mechanisms together. One mechanism opens the circuit instantly on short circuits or overloads of say 500 percent, while the other is a time-lag device which opens the circuit on continuous overloads of as little as 25 percent that persist for long periods.

Each motor must have its own protective device. The device which will be right for one one-quarter horsepower motor may not do for another because different types and makes of motors have different starting and operating currents for the same horsepower. In securing a protective device for a given motor it is necessary to know the voltage it is to be used on, the make and type of the motor, and the running current. All of this is given on the nameplate. If you have a Fustat or thermal switch you wish to use to protect a motor, its ampere rating should be the same, or not more than 25 percent higher than the amperes given on the nameplate of the motor. A protective device may be mounted directly on the motor or built-in to the motor at the factory, or it may be mounted separately in the motor circuit.

Motor starting switches with overload protection. They are mounted separate from the motor and are available in sizes for motors up to ½ hp. They cost from $2.50 up. Be sure to use the proper size for your motor.

Thermoguards, Therma-tectors and similar devices including Fustats may be built into the frames of fractional horsepower motors. They get heat directly from the motor windings by contact and are also heated by the current which passes through them. Thermoguards are of several types. Some reset themselves when the windings cool; others must be reset by pushing a button. Fustats must be replaced. It costs only 50c to $1 additional for motors having one of these protective devices built in.



Typical motor starting switches suitable for motors up to 7½ hp or larger in some places. They are similar in action and protection to the smaller starting switches described.

Small motor starting *switches* having thermal breakers are made by a number of companies. They are used for motors up to one-half horsepower on 115 volt circuits or one horsepower on 230 volt circuits. The thermal breaker kicks out when the motor is overloaded. It may be reset when the thermal element cools. The cost is from $2.50 upward.

Similar switches are made in larger sizes with different types of thermal breakers for use with larger size motors.

Magnetic switches are used on larger sized motors, usually over five horsepower. They combine a quick opening and closing switch for starting and stopping the motor, with thermal overload protection and in some cases special undervoltage protection. The magnetic switch may also be operated by a pushbutton or snap-switch control from some distant point, as in controlling a hoist motor from a load of hay.

Where undervoltage protection is provided, the circuit is opened automatically when the voltage on the line gets dangerously low. In some types of switches the circuit recloses itself when the voltage . . . . . (More on page 20)

AN EFFICIENT HOME DEHYDRATOR

Dehydrator Developed by University of Maryland and Tested by USDA Does a Good Job on Fruits and Vegetables. May Be Built at Home

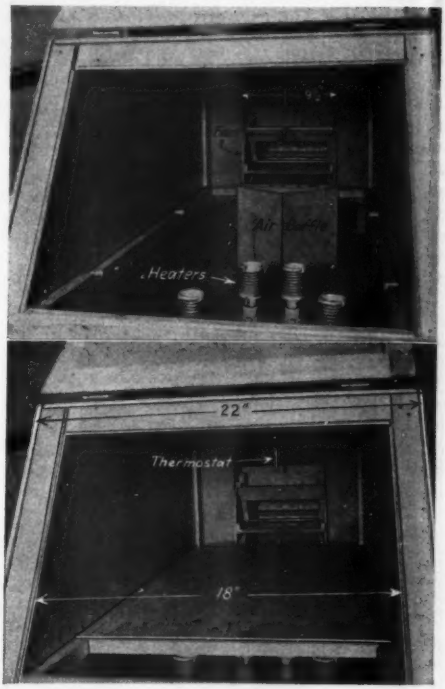
By **GEORGE J. BURKHARDT** and **A. V. KREWATCH***

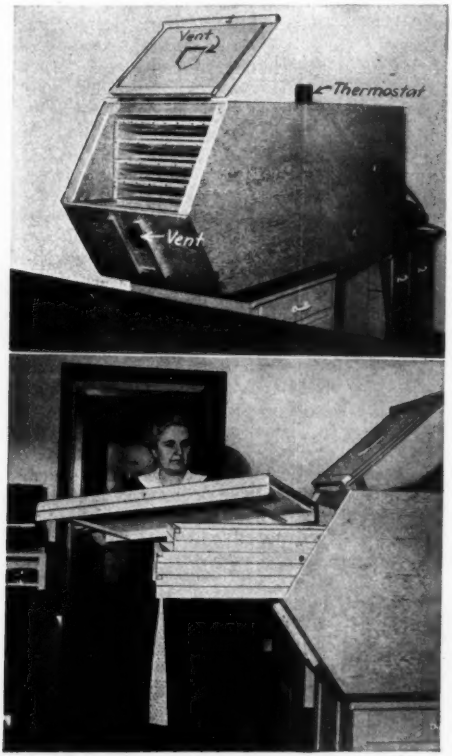
THE dehydrator illustrated in this article was built as an experimental unit for studying proper temperatures and air velocities for larger commercial size dehydrators. After tests had been made, Miss Lenore Sater of the Bureau of Home Economics, USDA, thought it had possibilities for home use and made tests on a similar unit under home operating conditions. Our general conclusions are that this style of dehydrator offers better possibilities for producing satisfactory dried products than some of the earlier designs which have been in use.

Experimental work is still in progress on this dehydrator. Some changes in proportions and in fan and tray design may improve it. The design is presented as the best we know at the present time. It is not too early to order materials and start building if the drier is to be used this season.

Drying is essentially the evaporation of water. Start with 11.2 pounds of fresh string beans,

*Mr. Burkhardt is Research Agricultural Engineer and Mr. Krewatch is Extension Agricultural Engineer, University of Maryland, College Park, Md.





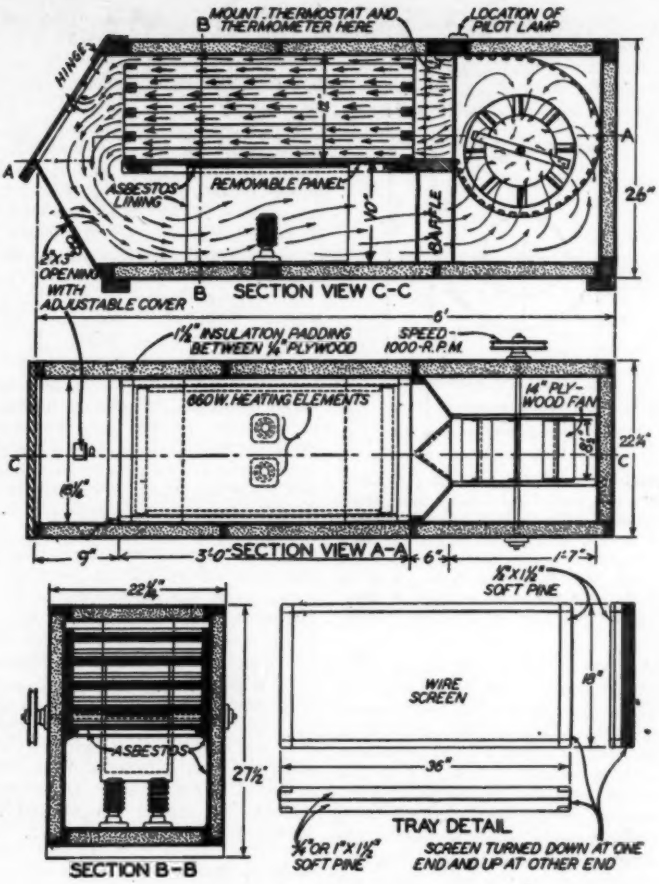
Above: Inside of the drier with the floor of the drying compartment removed. The number of porcelain receptacles in the heat compartment will depend on the wattage of elements used—two, if 660 w. elements are used; six, if 200 and 250 w. lamps are used. The air baffle directs the flow of heated air to either side of the fan housing. The fan is placed slightly different in the photograph than in the drawing. Follow the drawing. **Below:** The floor should fit reasonably snug, but be removable. The thermostat and thermometer bulb should be between the fan and the trays. The center of the fan shaft should be 1" above the floor level. The hot air duct below the floor should be lined with asbestos paper as a safety precaution.

Left—Above: Completed dehydrator showing trays in place. Each tray rests on the one below. A better arrangement for the home would be to make the trays only 1" or 1½" deep and nail rails of 1" x 1" dressed lumber to the sides of the drier for them to slide on. The door should fit tight against the opening with a sheet of Celotex or wood to fit into the opening to prevent air leakage. **Below:** Miss Lenore Sater of the USDA, who is in charge of the Beltsville laboratory studies, is showing how the trays are handled. If the trays are made 3" deep, as shown, the under side cross brace should be at the end so the screen can be bent down and tacked to it.

evaporate 10.2 pounds of water from them in an approved manner and you have one pound of dehydrated string beans remaining. The amount of water to be removed from apples, peas, potatoes, corn, beans, etc., varies from about 3.3 to 10 pounds for one pound of dried product.

In the Maryland dehydrator electricity is used for heating and for driving air over and through the trays for removing the moisture. The total connected wattage of heaters and fan motor is kept below 1,600 watts so the dehydrator can be plugged into an ordinary convenience outlet. Insulation is used on the cabinet to save heat and lower the operating cost. The air is recirculated, that is, kept moving over the trays and past the heating elements many times before it is exhausted, which also saves power. In this type of drier the food dries quicker if the air moves fast, so a large capacity homemade fan is used. It will move between 350 and 400 cu. ft. or air per minute over the trays.

The four trays each have an area of 4 sq ft. Putting on 1½ pounds per square foot gives a total capacity of 24 pounds. This takes approximately one bushel of beans. It will take several people a good half day to cut and blanch a bushel of beans, so a drier of this tray area is about all a farm family can prepare products for.



Top view is a longitudinal elevation through the center of the drier. It shows the movement of air past the heaters, through the fan and trays and out and into the vents. From 2 to 7 heating elements or lamps may be used. The center view is looking down on top of the drier as if it was cut through the center. It shows the placing of the trays and fan. Below, left, is a cross-section elevation through the heaters, and at the right are details of the tray used in the experimental drier. If you check closely, you will find that this drier looks higher and the fan narrower than the dimensions indicate. The dimensions are for the latest revised design.

How to Build It

The drier illustrated was built from 5—4′ x 8′ sheets of Plywall, which is a medium grade of plywood, clear on one side and knotty on the other. Flooring, shiplap, Celotex, Masonite, Stonewall board or similar materials having some structural strength would be satisfactory. The frame is made of 1½"x1" dressed lumber, to which the walls are nailed or screwed, leaving a 1½" space between boards for fill insulation. Spunglass or rockwool is good for insulation. Shavings may be used. The accompanying illustrations give the plan of construction.

The top of the cabinet should be held in place with screws so it can be removed easily for cleaning and for adjustment of baffle screens.

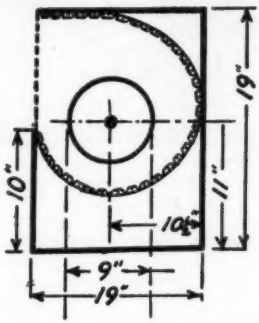
When in operation, the cabinet has no openings except the two vents shown at the front end. The top one discharges moist air, and the lower one takes in fresh air. They should have adjustable doors to regulate the vent openings.

Baffle screens may or may not be necessary. If one or two trays dry faster than the others, it may be necessary to tack a piece of ⅛" mesh hardware cloth about 2" wide across the drier in front of that tray to cut down the flow of air over it. One may have to do a little experimenting until a proper distribution is obtained.

Heaters may be screw base radiant heater elements as shown in the drawing, or ordinary Mazda lamps may be used. If 660 watt heaters are used, only two sockets are necessary. This is a standard size, but these heaters have been available in many different wattages. At least six receptacles should be provided if lamps are to be used as heaters.

Special drying lamps have no advantage in this type of drier.

An adjustable thermostat is desirable for controlling the temperature. It must be of a design suitable for temperatures up to 180° and a capacity of 12 amperes at 115 volts. Ether wafer thermostats used in brooders and incubators are not intended for temperatures as high as this, so either a special wafer or a different type of thermostat should be used. A pilot light may be used on top of the drier which comes on when the heaters are on. When it goes off you will know that the drier is up to the temperature of the thermostat setting.



Plywood side of fan housing showing 9" air inlets and sheet iron scroll fastened between sides. Cut sheet iron 11" wide. Bend down ¾" along each long edge, making a sharp right angle bend. Snip the edges in to the bend, then shape the scroll and nail in place against the sides of the fan housing.

The homemade fan is similar to that in a fanning mill. The eight fan blades are each 2½x8½" and made of ¼" plywood. They are set radially between two doughnut shaped rings of plywood having outer diameters of 14" and inner diameters of 9". The blades are nailed with 1" thin nails to blocks ½"x1"x2½" which are nailed to the inner sides of the rings. Cross braces 1"x2" are bored to receive the ½" steel shaft 28" long and with bearings outside the drier housing. The fan is held to the shaft by ⅛" pins or cotter keys.

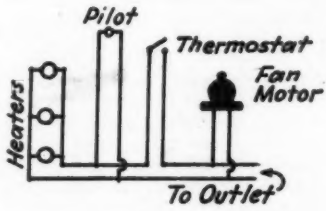
The fan housing is made of two rectangular pieces of plywood that fit snugly against the top, bottom and back of the drier. Air enters the center of the fan housing through 9" circular openings in each side. A scroll of sheet iron is fitted in between these sides to direct the airflow smoothly into the tray section.

The V belt drive from a ¼ hp. motor is outside the drier housing. With a 1,740 rpm. motor, the motor pulley should be 4" and fan pulley 7" or 2½" to 4½". Being outside the drier, the motor keeps cool and is easily moved to and from other jobs.

The trays shown in the illustrations have sides made of two pieces of 1" dressed lumber 1½" wide. The underside braces should be placed at the ends as shown in the drawing and not as in the photograph, so the screen wire can be tacked to them. These trays were made for experimental runs. For home use where it is desirable to take trays out occasionally to observe the progress of drying, it would be more convenient to make the trays of ½"x1" or ¾"x1½" strips with the screen nailed between sections, and then provide 1"x1" rails nailed to the sides of the drier for each tray to slide on. For acid or sulphured foods we recommend trays with bottoms of ¾" half rounds spaced 1" on centers and tipped at an agle of 15° with the horizontal. Solid bottom plywood trays were satisfactory except for apples which had a tendency to stick to the wood.

How to Operate the Drier

Have the drier hot before putting in the prepared material. Never turn on the heat without having the fan running. The moving air keeps the wood from overheating, and helps prolong the life of the heating elements. Put in the trays and keep the vents closed until the drier again comes up to the desired temperature. In general, the maximum safe finishing temperature for apples, apricots, peaches, corn, pumpkin and squash is 160°; for cherries, pears, string beans, peas, cabbage, celery and onions is 150°; and for berries and figs 140°. Greens were of better color when dried at 135° than at 150°.



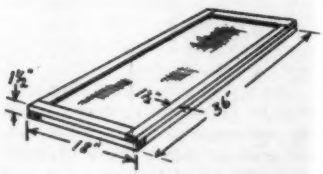
Drier wiring diagram. The heaters are all connected to the power supply through the thermostat. If a pilot light is used, it is in the same circuit. The fan motor is connected across the line so the fan will run whenever the drier is plugged in.

When the desired temperature is reached, start getting rid of the moisture by opening the vents slightly,—both the same amount,—and not so much that the temperature will drop more than a few degrees. As the drying proceeds, the vents may be opened more until they are wide open. You will find that the temperature will rise toward the end of the drying process unless you use a thermostat. This will have to be watched to prevent overheating and impairing the quality of the product. If you have no thermostat, adjustment will have to be made by unscrewing some of the heating elements.

Drying Time

The time required for drying will vary with the product being dried, whether it is peeled, sliced or sectioned, the depth and uniformity of spreading on the trays, initial water in the material, etc. In this drier sliced string beans dried in about 11 hours, kale in 9 hours and apples in 16 hours. A somewhat better product and considerably quicker drying was obtained when only ¾ pound instead of 1½ pounds per square foot was placed on the trays. The power consumption per dry pound was increased about 10 per cent with the thinner spreading, but the improved results seemed to justify the extra cost.

One must learn from experience to judge when the products are



Alternate tray design.

sufficiently dry. Fruits should be rubbery, not crisp. Vegetables should be crisp. Dried products should be stored in airtight containers. Not all dried products keep equally well.

EDITOR'S NOTE: Many colleges and other agencies have been studying small driers during the past year. Ask your home demonstration or county agent for additional information. The following have designed small driers in addition to the above: University of Idaho, Moscow, Id.; Ohio State University, Columbus, O.; Texas A. & M. College, College Station, Texas; Commerce Dept., TVA, Knoxville, Tenn.; REA, St. Louis, Mo.; Houston Lighting & Power Co., Houston, Texas; Puget Sound Power & Light Co., Seattle, Wash.; Duke Power Co., Greensboro, N. C.; Bulletins on homemade driers and dehydration are available from Extension Service, Univ. of Nebraska, Lincoln, Neb.; University of Tennessee, Knoxville, Tenn.; Georgia Experiment Station, Experiment, Ga.; Univ. of Illinois, Urbana, Ill.; USDA, Washington, D. C. Some thirty manufacturers have applied to the government for materials to put home dehydrators on the market this summer. Research work on the drier described in this article is still under way at the USDA Home Economics laboratory, Beltsville, Md. Next month we will have a description and illustration of a less efficient but very inexpensive drier made of apple or store boxes and a table lamp.

Word has been received from the USDA Beltsville laboratory just before going to press that a drier built according to this plan but shortened 18 *inches to use trays* 18"x18" *gave equally good results and slightly faster drying. They also tried eight shallow trays in place of the four* 3" *deep trays. The drying was a little slower than with four trays but quicker than when the same quantity of vegetables was placed on four* 18"x36" *trays in the longer drier.*

Omitting the metal scroll around the fan did not impair the drying results.

Double strength glass trays have given good results in Virginia tests.

What Our Milk Cooler Does for Us

Winning Letters in Our March War Production Contest. Farm Milk Coolers Save Milk, Save Labor, Save Money and Help Get Better Prices. Used for Many Things Besides Milk.

Winner of First Prize—$25 War Bond

MRS. NELLIE PHILLIPS, Forest, Va.

Winner of $5 in War Stamps—Second Prize

WM. E. HUBER, R 1, Macungie, Pa.

Five Winners of $3 in War Stamps

C. W. BARKER, Pine Knoll Farms, North Leeds, Maine

MRS. WM. F. THOMAS, RD 1, Gansevoort, N. Y.

PAUL LANGENBERG, R. No. 5, Iowa City, Iowa

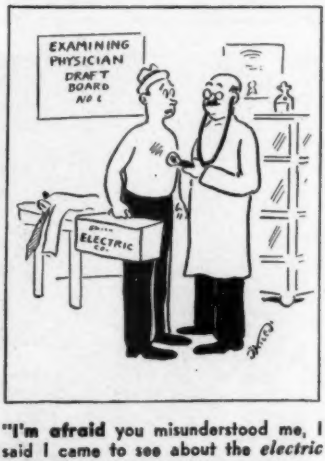
J. M. DENSON, Route 1, Helena, Ala.

MISS SUSAN L. BROWN, R.D. 1, Walden, N. Y.

Cooler Used for Many Purposes—Saved $288.25 Over Cost of Ice

We do general farming on 140 acres and milk 26 cows. We used to use ice and a hand cooler to store milk over night as we deliver once a day. Then we bought a six can cooler. When we used ice, we bought a 300 pound block every other day during Dec., Jan. and Feb., and 300 pounds every day for the other 275 days.

300 lbs. every other day—3 mo. @ $1.05	$47.25
300 lbs. on 275 days @ $1.05	288.55
Yearly ice cost	$335.80



"I'm afraid you misunderstood me, I said I came to see about the *electric* service!"

Our electricity bill last year was $95.00. This included electricity used to operate a washing machine, iron, radio, electric churn, brooder for 100 chicks, lights in laying house and smoke house and a milking machine from July 1, 1942. Ice cost of $335.80 less electricity cost of $95 left a saving of $240.80. We also have a low bacteria count that runs around 3,000 to 5,000. We formerly could not keep the count under 35,000.

Our spring water is too warm for drinking so we run it over the milk cooler whenever we want cold water. We have no refrigerator for house use so I put ice tea in glass jugs and sink them in the brine tank or run the tea over the surface cooler. I put my vegetables, left-over meat and butter in gallon buckets with tight lids and drop them in the cooler tank. We kill fresh meats, cut it up and pack in ten gallon milk cans and it keeps for weeks.

I sold lots of young chickens last year. They had to be dressed the day before and sent to town on the milk truck at six o'clock in the morning. I dressed the fryers, put them in lard cans with good lids in the cooler tank, and they were in perfect condition when they reached the stores.

In addition to the $240.80 we saved in cash, we saved the gas, tires and time it took to drive an extra half mile to get ice.

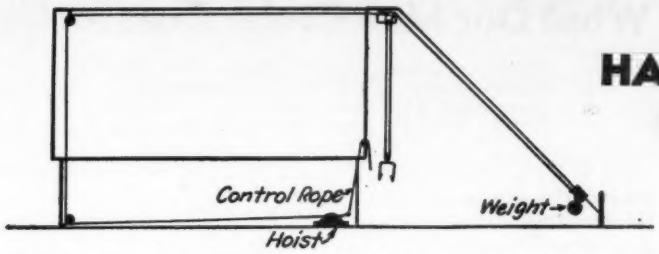
MRS. NELLIE PHILLIPS,
Forest, Va.

Cooler Makes Profit of $176.25 a Year

I will give you the facts as I have found them on our 112 acre farm. After having a lot of trouble trying to cool milk down

. . . . . .(More on page 22)

HAY HOISTING POINTERS



Sketch of a labor saving arrangement of an electric hay hoist. The man on the load does the whole job—stick, hoist, trip and pull back.

YOU can hardly afford to buy a motor just for hoisting hay, even if you could get one. But you can save quite a few man-hours and horse-hours of labor by rigging up a properly planned hoist, if you can borrow a motor temporarily from some other piece of equipment. You can operate a hoist with anything from a one to a ten horsepower motor. The power consumption is trivial in comparison with the labor saved, being perhaps less than 25 kw-hrs for the season on most farms.

We still believe that the best labor-saving method of hoisting hay is one developed years ago at Oregon State College and now being used also at the University of Tennessee. It consists of a single drum hoist with a single lever control. The control lever has a weight or spring which throws out the clutch and puts on the brake when the lever is released. When pulled to its center position, the brake and clutch are both released and the drum is free to turn. When the lever is pulled to the hoisting position, the brake is free and the clutch engages. By placing the hoise near the load inside the barn, the hoisting lever can be controlled from the load by a rope carried over pulleys. The fork is pulled back by a counterweight. The man on the load can then do the hoisting and pull-back from the load. It is the quickest, safest and most convenient method we know of. (See sketches). Some two lever controlled hoists can be built over into this type at home.

The power required for hoisting depends on the speed of hoisting. If you lift slowly enough, you can use a small motor. Assuming a fork load of 500 pounds and an overall efficiency of 25 per cent you can hoist at these speeds:

1 hp motor hoists 16 ft. per min.
2 hp motor hoists 33 ft. per min.
3 hp motor hoists 50 ft. per min.
5 hp motor hoists 82 ft. per min.

A reminder of the simple relationship of pulleys to power and speed may be timely. In the sketches, with the rope arrangement at (1), the load travels at full speed and uses full power; at (2), the load travels at half speed

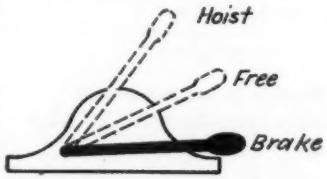
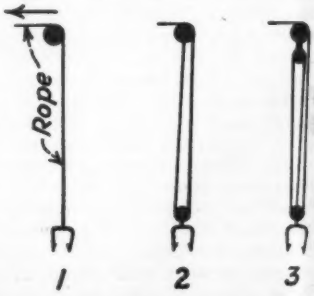
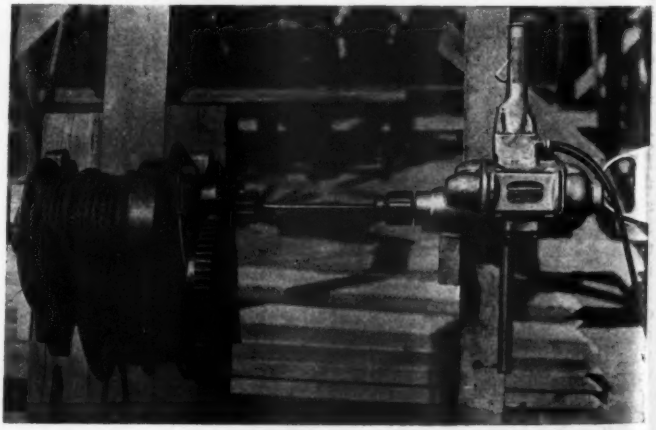


Diagram of a one-lever hay hoist. When the lever is pulled up by hand or rope to the top position, the clutch is held in and the drum turns. In the middle position the clutch and brake are both free, and in the lower position, where it is held by the weight or a spring, the brake is set so it will stop a load half way up if the "hoist" rope is released. A clever mechanic can improvise such a control on most hoists.

Tackle for hoisting. In (3) the two sheaves at the top would be in one block in haying tackle.





An electric drill, ¾ in. size, with a one-horsepower motor, operates this hoist with a lifting capacity of 1,000 pounds. A gear welded to a bit shank transmits power to the hoist. A dog holds the gear engaged during the lift. The speed of lifting is about 15 to 20 feet per minute.

and requires only about half the power; at (3), the load travels at one-third speed and calls for only one-third the power. With most hay carriers, the arrangement at (2) is used. With it the load is lifted at half speed but travels at full speed along the track where little power is neded. If the same motor was used with each of the pulley arrangements shown, you could lift twice as heavy a load with arrangement (2) as with (1) and three times as heavy with (3).

If the drum on your hoist is 8 inches in diameter with one layer of rope on it, making the total diameter about 9½ inches, the drum should turn at the following revolutions per minute for the speeds indicated:

13 rpm 1 hp	40 rpm 3 hp
26 rpm 2 hp	66 rpm 5 hp

Some hoists and pulley systems are more efficient than others, so the figures given are only approximations. If your load is taken off in slings and each sling-full weighs 1,000 pounds, then you must either double the power or operate at half the speeds given above.

Pointers on Making Butter

If you have been in the habit of buying butter but now find that it would be desirable to make your own, here are some pointers on doing it that may be helpful.

Cream for churning should be reasonably heavy—25 to 35 per cent butter fat. It should be kept in a cool place until the desired amount for churning has been accumulated. Sour cream is easier to churn than sweet cream. It may be soured or ripened by keeping it at a temperature of about 70° the day before churning. During the night before churning the cream should be cooled—to about 48° in the summer time and 58° in the winter. The right temperature is important in churning.

Scald the churn, then rinse with cold water before putting in the cream. Fill the churn half full. Churn with a steady motion and vent the churn every five minutes if it is sealed like a barrel churn to let out the gas. Stop churning when the butter particles are the size of wheat grains. The butter should "come" in 20 to 30 minutes. (If you turn by hand, that's a long time; if you use a motor, it will just give you time to wash the dishes.)

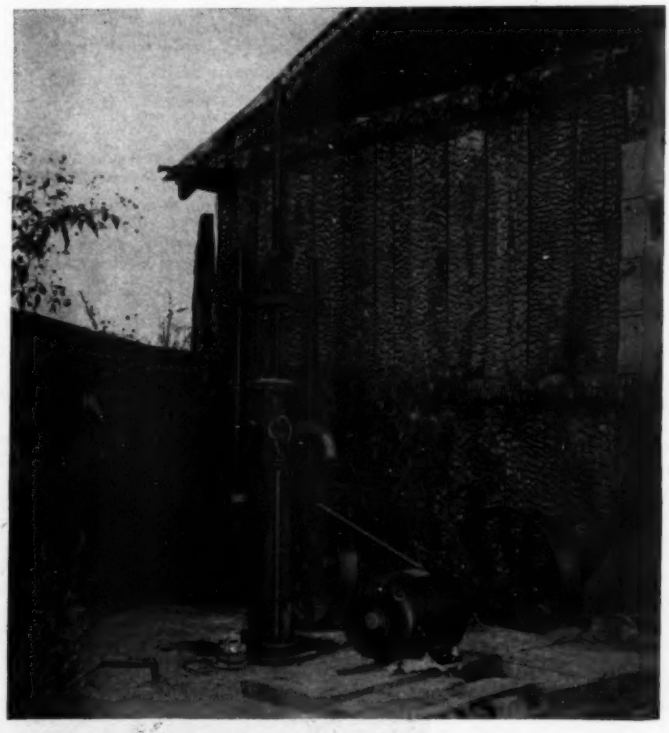
Draw off the buttermilk through a strainer. Wash the butter with about twice as much cold water as there is buttermilk. Remove the butter; add an ounce of salt to the pound of butter and work out the water.

Improving Cesspools and Septic Tanks

Cesspool and septic tank operation failures often coincide with the winter freezing and spring saturation of soils. Failure is usually traceable to inadequate size of septic tank, resulting in incomplete digestion and stoppage of the pipes and soil, thus preventing adequate absorption. Remedy consists of adding another tank and generally necessitates replacing the distribution tile in gravel filled trenches. This increases the absorbing soil surface. Lines may also require extension. Cesspool failures are common in any but the most open types of soil. Pumping out and cleaning cesspools is of little help since the soil has become impervious. Replacing it with a septic tank of adequate capacity is recommended. Ordinary cesspools often constitute a menace to health and a threat to surrounding potable water supplies.

W. C. Krueger, N. J. Extension Service.

★ ***Buy War Bonds*** ★



It took only one small fire to make A. L. Hagen, dairy farmer of Flemington, N. J., resolve that "it won't happen here again." The above picture shows how he carried out his resolution—through the installation of an electric motor to replace the gasoline engine which set the shed on fire. The new motor not only protects the farm from a dangerous fire hazard, but it is also more reliable and economical. *N. J. Exten. Service*

Electrical Housekeeping

Edited by **GAIL MEREDITH**

Use Kitchen Mixer for Good Mixing

WITH an electric mixer standing on your work table within cord's length of a convenience outlet, you can make short work of mixing up this war time brown bread. In fact, it takes such a little time that you should have the 9 x 5 pan greased, the oven heating, and all of the ingredients measured and ready before you combine them at all.

Good War Bread

You need one cup of whole wheat flour, one cup of flaked bran, and two cups of all purpose flour, enriched, I hope. Measure out three-fourths of a cup of dark corn syrup and two cups of buttermilk. Then set out the soda, baking powder, salt and salad oil, and you are ready.

Be sure the beaters are securely in place, taking hold of the stem, rather than the curved blades, to push them up into the sockets. When the mixer is ready, dump the flour and bran into the large bowl and add 1½ teaspoons of soda, one teaspoon of baking powder and two tablespoons of salt. Turn on the motor and mix the dry ingredients, thoroughly and slowly. After they are well mixed, add the syrup and the buttermilk, together with a tablespoon of salad oil. Keep the mixer going slowly until the ingredients are well combined. Pour the batter into a greased pan and let it stand for an hour before you bake it. This bread demands baking in a 350 degree oven for about an hour.

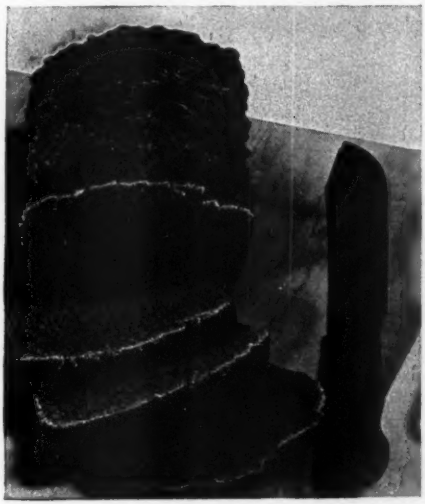
Scrape every bit of the dough out of the bowl with a flexible spatula. Clean the beaters with the spatula, too, rather than striking them against the edge of the bowl. That is bad on two counts. You may bend the beaters and you may chip the bowl.

"Frosted" Meat Loaf

Sometime when you want to turn a little meat into a lot, and when you have the time to make something extra special for the family make this meat loaf.

½ lb. ground beef
½ lb. ground veal
1 lb. ground smoked ham
½ cup cracker crumbs
1½ tsp. salt ½ tsp. paprika
½ cup finely diced celery
1 cup finely shredded carrot
½ cup finely diced green pepper
¼ cup finely chopped onion
3 tbsp. chopped pimento
1 egg ½ cup tomato juice

Place all the ingredients in the large bowl of your beater and mix them slowly, at first, then after they are well combined, at a good brisk clip for about two minutes. Bake the loaf in a greased pan for about an hour and a half in a 350 degree oven.



But that isn't all. So far it sounds like a good meat loaf, but nothing much different from your own favorite recipe, perhaps. But listen a minute. You frost it next. While the loaf is baking, cook potatoes until they are tender, then dump them into the large bowl of your mixer, preheated with warm water while the potatoes are cooking. Start the mixer slowly, turning the bowl by hand and lifting the beaters up and down to chop the potatoes to pieces. When they are broken up, the bowl will turn by itself, and you can add butter and hot milk, about half a cup of milk to two pounds of potatoes. Speed up the mixing now, scrape the potatoes down the sides of the bowl, and beat them until they are light and fluffy.

If you have your timing right, your meat loaf will come out just when you finish the potatoes. Take these hot potatoes and spread them over the top and sides of the loaf. Put it back in the oven, pushed up to 400 degrees, just long enough to turn the potatoes a delicate brown. Do you have a pot of parsley in your window? If you have, clip off a few sprigs for a garnish around the edge of the platter.

Whipped Banana Gelatin

In case you have been able to get bananas lately, and they do come through now and then, you can add one to a package of strawberry gelatin and whip it into a very attractive dessert.

Dissolve the gelatin in water according to the directions on the package, and put about a quarter of it in a mold in the refrigrator. Chill the rest, then pour it into the small bowl of your mixer with the sliced banana, and whip it at a good speed until the banana is

blended with the gelatin and the whole begins to keep its shape. It may take several minutes. Then pour the whipped gelatin on top of the other and chill until firm.

When you unmold it, you can decorate it with more sliced bananas, or when strawberries come, with chopped or sliced berries.

This fluffy texture makes a pleasant change from the clear gelatin and reconciles the family to getting along without whipped cream. It is a recipe geared to war. Easy to make, using no points, and calling for no rationed foods. Try your own combinations with the fruits of your garden.

Preparing Fruits and Vegetables for Drying

Selection: Use only fresh, ripe, sound foods, picked young and tender, just right for table use. Drying will not make a good product from a poor one.

Speed: The faster you work in getting the food from the garden to your kitchen, and in preparing it for the drier, the better the dried product will be in flavor, in texture, in color, and in food value. Pick and prepare your food in quantities you can take care of in a hurry.

Cutting: Cut food in uniform pieces; most root vegetables should be cubed or sliced; if they are sliced, slices about a quarter of an inch thick are best. If the slices are too thick, it takes longer to blanch the food, longer to dry it, and longer to refresh it and cook it for the table. Very thin slices have a tendency to stick together on the trays, hindering even drying.

Checking Changes: As soon as the cut surfaces are exposed to the air, certain changes in color, flavor, and food value begin. To control these changes, foods may be dipped in an acid or a salt solution, sulfured, or blanched in steam or boiling water.

Salt Solution: One method of preventing the darkening of apples is to put them in a salt solution for about ten minutes, —four teaspoons of salt to each gallon of cold water.

Sulfuring: Sulfuring not only preserves the natural fruit color and flavor, but protects certain vitamins during the drying. Farmers' Bulletin 1918, DRYING FOODS FOR VICTORY MEALS, gives the following directions for the process:

"Work out of doors. For small amounts of fruit the sulfuring chamber may be simply a tight packing box or a wooden frame covered loosely with roofing paper or wall board. It should be high enough to cover a stack of trays and wide enough to allow about a foot of extra room for the sulfur pan. At the bottom of the sulfuring box allow a small space for air to enter—otherwise the sulfur may not burn.

"Two blocks of wood laid on the ground will form a support for the loaded trays. Stack the trays one upon the other with pieces of light lath between. The lowest tray should be 6 to 8 inches from the ground.

"Measure out 1 level teaspoon of sulfur for each pound of prepared fruit. Don't use too much sulfur. Wrap the sulfur in a small piece of paper and place in a shallow tin can. Set the can of sulfur on the ground in front of the loaded trays. Light the paper, and quickly place the sulfuring chamber over trays and can. It should cover the trays completely to prevent loss of sulfur fumes.

Apricots	1½ to 2 hours
Peaches	1 to 2 hours
Pears	3 to 4 hours
Plums	20 to 25 minutes

Use wood slat trays for sulphuring; never wire screen.

Steaming Fruit: Another way to prepare such fruits as apples, apricots, and peaches for drying is to steam them five to seven minutes.

Steaming Vegetables: Vegetables should be blanched in steam or boiling water before they go into the drier. Recent experiments indicate that steaming is preferable. Vegetables blanched in steam keep better, retain more of their food value and vitamins, and go to the table looking and tasting better.

If you have a pressure cooker, that is ideal for this steaming. If you haven't, use any large container that can be fitted with a wire basket to hold the food, a rack to keep the basket out of the water, and a tight-fitting cover to keep the steam in.

Have the water heating while you are getting the vegetables ready, so it will be on the boil when they are ready to go in. Continue the steaming until the pieces of food are heated through, stirring it about in the basket occasionally. Extension Nutritionists at Ohio State University give the following blanching time for vegetables more commonly dried:

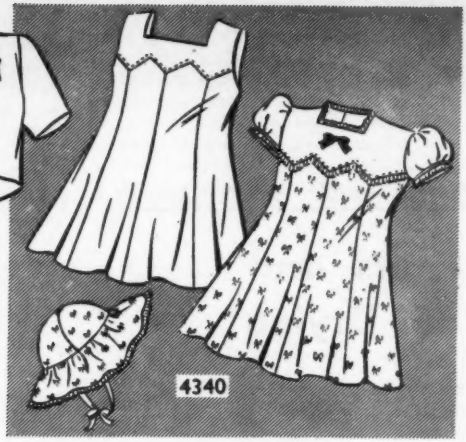
Beans, green	15-30 minutes
Beans, lima	15 "
Beets	20-30 "
Corn	10 "
Greens	5-7 "
Peas	10 "

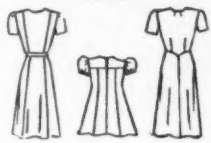
Packing the Trays: Move the foods from the salt solution, from the sulfur bath, or from the steamer directly to the trays of the drier as fast as you can. Do not overload the trays; it is better to have most products only one layer deep. If you are drying apricots or peach halves, turn them pit side up to keep the juices in.

Drying: The length of the drying time varies with the type of food, the size of the pieces and the kind of drier.

Many Small Savings Make Big Ones

One day last winter I walked through one of the laboratories at a big state university and saw, written on the blackboard, these four small ways of making regular savings of food, savings for the welfare of the family, savings for economy, and savings for





Summer Dress Patterns

Pattern 4363 . . .Look gay in a check cotton frock and contrast bolero in crisp white. Sizes 12 to 20. Size 16 requires 3⅞ yards 35-inch fabric; bolero, 1⅜ yards contrast.

Pattern 4340 . . . A dress, a sunfrock and a bonnet, all in one simple child's pattern. Sizes 2 to 6. Size 6, frock and sunbonnet, 2⅜ yards 35-inch fabric; ⅓ yard contrast; sundress and bonnet; 2¼ yards 35-inch fabric.

Pattern 4260 . . . There's unusual flattery through bustline and waist in this frock. Sizes 34 to 46. Size 36 requires 3¼ yards 35-inch fabric.

Price of each pattern 16c (in coins). Send orders to ELECTRICITY ON THE FARM, Pattern Dept., 243 W. 17th Street, New York, N. Y. Allow plenty of time. Mail is slow these days.

4363

4260

patriotism. Do you make them?

1. Scrape your mixing bowls and save that extra bite. If you have a rubber spatula, scrape them with that.
2. Consider the water you use in cooking.
   a. Use as little as possible when cooking vegetables.
   b. Have it boiling when you start the cooking.
   c. Use the water you soaked them in for cooking beans or dried fruits.
   d. Save any water that is left from cooking vegetables. It adds both food and flavor to cocktails, soups and gravies.
3. You can catch extra vitamins:
   a. By brushing carrots instead of scraping them.
   b. By using the outside leaves of lettuce for soup or a wilted salad.
   c. By using celery tops and boiling water as a soup base or beet tops for greens.
4. By remembering that the heel of the last loaf of bread can be grated, or crumbled with a rolling pin for stuffings, for crumb cookies, bread puddings, breaded cutlets, or topping for casseroles. If you don't grind it small, you can cut it in cubes and bake it or brown it in a little shortening to eat in soup or with a bland vegetable.

Why An Electric Range is Different

By MISS SUSAN L. BROWN, Roubol, Waldon, N. Y.

I have cooked on all types of stoves and my choice is the one fed by wire—the modern electric stove. I like it because it operates without a stove pipe or chimney, and the heat comes instantly when I turn a button on the front panel of the stove. It is clean heat that does not discolor or blacken my pots and pans.

The odorless fuel is always ready and is furnished by the local electric company, therefore I have none of the disagreeable work attached to wood, coal, oil or gas ranges. I never have to use a match to kindle a fire, one fire hazard less. No danger from asphyxiation when a button has been accidentally turned on and left on for a while. That sort of carelessness only wastes energy, and my bill warns me to stop the bad habit quickly.

One attractive feature of the range is the insulated, automatic, heat-controlled oven. Complete meals can be cooked without watching, which cuts down the kitchen work and leaves a person free to do work in another part of the house, or to take the afternoon off, attend a club meeting, or work for the Red Cross or Civilian Defense. By preparing your meal before you leave and putting it into the oven, setting your clock and the time switch, and adjusting the oven temperature, you can go and return to find your meal ready to dish up and serve when you return a few hours later.

There is no cause to worry while you are gone for the electric range is dependable; it is safe from fire and explosion hazards.

Best of all in the hot summer months you can work in a cool kitchen when preparing a big meal for threshers and silo filling men as the electric range gives out very little heat in the room.

And it is so easy to keep clean. The smooth enamel surface is quickly wiped off with soap and water, then dried. There is no need for oil or polishes. In the canning season the oven can be used to process fruits, thereby saving time and labor.

There is a difference when you use an electric stove, and, come the peace, I would like to see one in every farmhouse kitchen to help lighten the load busy farm women carry.

Just Out . . . Our New Summer 1943 Pattern Book

Our new Pattern Book for Summer 1943 is ready! It's a complete, practical, inspiring summer summary of fashion in wartime. Each style pictured is available by mail in a pattern that is amazingly easy to use. Are you doing war work? You'll find outfits for farm or factory; for desk job or volunteer service. Are you keeping up the home front? There are crisp, cool housefrocks, neat aprons and Victory-gardener styles. Are you having a baby? Our "sewing for two" section has both maternity and infants' wear. There are charming frocks to make up in the new prints and bordered fabrics, many gay sports outfits, slimming styles for matrons, budget-minded wardrobes for young people, and slick tricks for fabric conservation. Also, an actual, ready-to-use pattern is printed right in the book! An outstanding value—this Pattern Book—at only 10c a copy! (coin)

Send orders to ELECTRICITY ON THE FARM Pattern Dept., 243 West 17th St., New York, N. Y. Allow plenty of time.

★ *Buy War Bonds* ★

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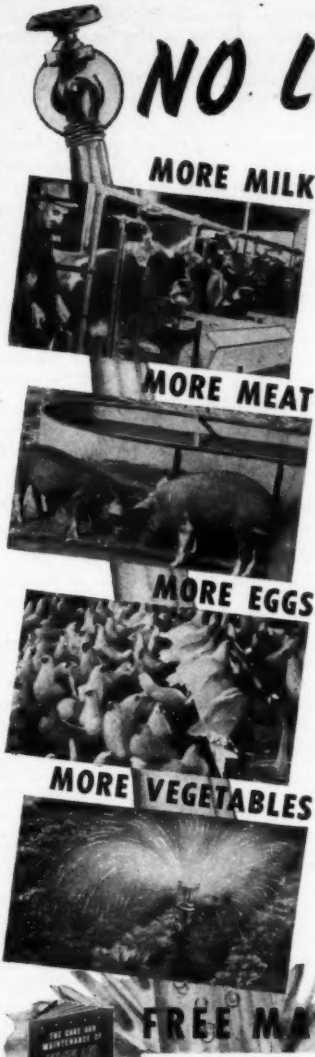

Busy WATER SYSTEMS Produce MORE FOOD!

★To meet Uncle Sam's 1943 quota requires a near-miracle of food production. But resourceful American farmers will make greatest possible use of their equipment and facilities to reach the gigantic wartime food goal. Many water system owners will extend their water lines this year—put in more piping, more outlets to utilize full pumping capacity for increased production of milk, meat, eggs and vegetables.

It's a matter of record that farm animals consume more water and show up to 20% greater production when plenty of fresh, clean water is always handy. If you need more outlets—if you require repairs or replacements, see your nearest Myers dealer.

FREE MANUAL

Fully illustrated. Tells how to make *minor* adjustments and repairs on all makes of pumping equipment. Contains useful information on all types of pumps. Mail coupon.

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Rejected Milk Churned in Washer

One day last summer I had a can of sour milk back from the creamery. I did not want to throw it out so I cleaned my washing machine and put the milk in and churned it. It was very easily done and was not much of a job to clean up the washer. Now, whenever I have sour milk to churn, I just put it in the machine and the electric motor does the churning.

MRS. LUCAS S. EKERN,
Whitehill, Wis.

Our Milk Cooler

. . . . . (Here from page 15)

below 60, I bought an electric cooler in the spring of 1936. Everything I can say about it since is good.

As a tenant farmer, we had to carry four 10 gallon cans of water 100 feet through the barn to the milk house twice a day. It was not so bad when we had four growing boys at home and labor was little more than 10c per hour, but it would be impossible today.

The running expense for my cooler is not over $2 a month through the year. Since 1936 I have spent $31 for repairs, or less than $5 a year. I am shipping 200 to 400 pounds of milk a day, so my expense is 2½c to 3c a hundred.

Before getting our house refrigerator we kept milk, butter and a lot of eatables in the cooler, and today if we want cold coffee, tea or cocoa in the summer months it still goes in the cooler where it cools in one-fourth as much time as in the refrigerator. Some milk dealers who are less particular about the quality of milk pay 15c a hundred less than I get. That amounts to $150 per year. I save at least one-half hour a day, which at 30c an hour would amount to $56.25 a year. My labor savings and better price amount to $206.25 per year. The expense to run and repair the cooler cost $30 a year, leaving a net profit of $176.25.

Also I have the satisfaction of producing better milk for my family and the buyers, and I am not afraid of losing my milk pay because of rejections.

WM. E. HUBER,
R. 1, Macungie, Pa.

Cooler Boosts Grade of Milk

• This letter is from a poor old fellow past sixty years old who is handling fifty head of cattle and milking twenty-eight cows alone. But here is the secret of it all. I have put electric power to work for me in many ways. It is the cheapest help that I can get and by far the best. To speak of only one thing is to slight all the rest of the equipment.

But I will speak of the milk cooler which I purchased two years ago. Two months after it was installed I was changed from shipping grade B milk to Grade A milk. The difference in the price of the grades of milk has paid for the cost of the cooler. Since then I have been changed to Golden Guernsey milk, a still better grade. All of this would have been impossible with the old style ice tank. In past years I used to store about fifteen hundred cakes of ice costing from seventy to one hundred dollars a year, besides the time spent in putting ice in the milk tank every day, which took about thirty minutes, and also the spoiled milk we had when for some reason we failed to ice up. This makes the electric cooler one of the best paying investments on the farm. The cost of the electric power is very low as I am on the low power price. I should say about one dollar to two per month but that is hard to get at as all of the different motors are on one meter. One thing I do know, it is much cheaper than the old tank that had to be filled with ice every day.

C. W. BARKER,
Pine Knoll Farms, No. Leeds, Me.

No Cooler—No Dairying

• We filled our old ice house in 1936 for the last time. It was either a new ice house or a milk cooler. Several times that summer we drove to neighbors who had coolers and we talked to our ..... dealer. We decided we would buy that cooler in the four can size and we have not regretted our choice.

Often at the end of a hard day in the hay field and working late to get the hay in, it seemed as if it was the last straw to have to go to the ice house, dig out, lift and drag that ice to the milk house, wash it and put it in the vat to cool the night's milk. You who have changed to an electric milk cooler know the other side of the picture—just milk, put the cans in the cooler and forget them until morning.

Now for a comparison of cost. The cooler costs about the same as rebuilding the ice house. By comparing our light and power bill before and after getting the cooler, taking the seven months of the year when the cooler is used, we get a pretty good estimate of power cost. No charge is made for the time of my husband, son and our truck for drawing and packing ice. My figures are for a six-year period.

Ice, man to help put it up, and extra sawdust.....		$120.50
Current for 6 yrs...	$70.00	
Repairs on cooler for 6 yrs.	19.75	89.75
Saving		$30.25

The actual money saving for us has not been as much as the saving in time, hard work and bruised toes, which is too great to be figured in terms of money. My husband says if he had to go back to cooling milk with ice and milking by hand at his age, he would give up dairying.

MRS. WM. F. THOMAS,
RD 1, Gansevoort, N. Y.

More light enters a house through the new plastic window screens than through metal screens because the plastic is transparent.

"Keep 'em Frying"
If you are using a Monarch Range — write for free booklet entitled "How to Care for your Monarch Range"—mentioning the kind of fuel you use.
MALLEABLE IRON RANGE CO.
1243 Lake St. Beaver Dam, Wis.
MONARCH RANGES
are built to last

Questions and Answers

Two-Gallon Water Heaters

▶ **Question:** *Send me information about the little two-gallon plug-in water heaters, advertised in* ELECTRICITY ON THE FARM *some time ago.* Mrs. L. B., Pa.

▶ **Answer:** That little two-gallon water heater listed in our December, 1941 issue was made by the Edison General Electric Appliance Company, 5600 W. Taylor Street, Chicago, Ill., and the Hynes & Cox Electric Corp., 406 N. Pearl Street, Albany, N. Y.

Because of war restrictions, these little heaters are no longer being manufactured. It is possible that local dealers might have a few of them available from stock made before the war.

Can Burned Motor Wire Be Re-Enameled?

▶ **Question:** *As it seems impossible to get new enameled copper wire, is it possible to take the enameled wire out of a burned-out motor and dip it in enamel or varnish to make it good as new? Will the heating change the wire? What enamel can one use? Where can I get it?* K. G., N. Y.

▶ **Answer:** The conductivity of the copper would probably not be greatly affected, but the enameling process is one which requires complicated machinery to get uniform coverage and exact thickness. Research laboratories have endavored to re-enamel old wire but without success. The enamel, so far as I know, is used by only one company and is not available as an enamel.

Freezer from Refrigerator

▶ **Question:** *Would an electric refrigerator used only for frozen foods be satisfactory?* E. J., Mo.

▶ **Answer:** Offhand I would say that you could use your ordinary domestic electric refrigerator as a frozen food locker only up to the capacity of the ice tray compartment. Some refrigerators, however when set at low temperatures will freeze foods in a tray just below the ice cube compartment.

While I would not recommend that you spend any money in trying it, there is a possibility that a good modern electric refrigerator would make a fairly satisfactory frozen food locker if you could build another box completely around it with about six inches of fiber glass insulation between and a refrigeration door on the front so you would have a double door into the freezing compartment. You might have to block off about one-third of the bottom of the food compartment and put in a flat tank holding about three or four gallons of brine as a cold reservoir. The compressor unit and the condenser would have to be kept outside of this supplemental box.

I do not know of anyone who has ever tried this but it might work.

Darner for Sewing Machine

▶ **Question:** *Where can I get a darning attachment for a sewing machine such as shown in the January issue of* ELECTRICITY ON THE FARM?

Mrs. G. H. R., New York

▶ **Answer:** Attachments for sewing machines are no longer being manufactured so they are getting scarce. The New Home Sewing Machine Company, 127 East 28th Street, New York City, still have a few darning attachments on hand. The Singer Sewing Machine Company suggests that local dealers may still have some of these attachments, and if your local dealer does not, you might ask him to get in touch with the district office, which may be able to locate one for you.

Puree Maker

▶ **Question:** *Where should I send for an electric puree maker and vegetable juicer? Montgomery Ward has juicers but I find no puree makers mentioned in their catalog.* C. L. B., New York

▶ **Answer:** Electric vegetable juicers are also used as puree makers. The same appliance will do both jobs. These juicers are probably available from most department stores and Mail Order houses, although their manufacture has now been discontinued for the duration of the war.

Direct Current from Radio Tube

▶ **Question:** *How could I hook up a rectifier tube from a radio to a 6-8 volt transformer so I could get 6 volts direct current?* E. S., W. Va.

▶ **Answer:** I would say that it is impossible to hook up a rectifier tube from an old radio to a 6-8 volt transformer and get any direct current. The reason for this is that the resistance of the tube is so high that the 6-8 volt transformer would not have voltage enough to operate the tube. (C. E. JEERINGS)

Manure Carrier and Sack Elevator

▶ **Question:** *I have several poultry houses thirty feet wide and three stories high. I would like a manure carrier from the house to put on a manure spreader. It should be 24 feet long and so it could be moved from one house to another. Please give me all the details that you possibly can.*

I have been figuring on also a sack elevator with an arm on a belt so every time it comes around it will carry a sack of poultry feed to the top of a four story building and dump it off. I can feed all chickens from the top floor and not have to carry feed to each hopper. All of our farm help is gone and it is too much to do for the force I have. G. H. P., North Carolina

▶ **Answer:** It would seem to me that you could use a very simple belt conveyor for taking the manure from your poultry houses to the spreader.

Elmer the Bulhorg *announces* —

Now available—new Victory Model

PRIME HI-LINE ELECTRIC FENCE CONTROLLER

[Underwriter-approved unit with all the famous Prime features for effectiveness and safety.]

★ Make wire go farther with single-strand fence.
★ Recover feed crops that would otherwise be wasted.

Now *you* can enjoy the advantages of top-quality hi-line electric fencing *this season* . . . Prime has saved critical materials—and that saves money for you . . . Same operating mechanism, same electrical output as famous Prime Grand Champion . . . Plenty of safe "kick" on the wire—big savings of time—savings of pasture and feed . . . Ten-year record of success. See your Prime dealer now.

The Prime Mfg. Co., Milwaukee, Wisconsin

My suggestion would be to make a conveyor which would look something like the elevator shown on page 6 of our January issue, but using a wide canvas belt without cleats in place of the chain and flights. The width of the elevator would depend upon how wide a belt you could get. You would need only a small hopper at the end and the conveyor could be operated easily by a ½hp motor. The side boards should probably be 10 in. or 12 in. x 1 in. with the board to support the belt about 5 in. down, giving you a conveyor 5 in. in depth. The rollers at each end should be about 4 in. in diameter and the speed of the belt about 200 ft. per minute. You would need to have legs or some other means of support at the spreader end of the conveyor and also a scraper to clean the conveyor belt. This scraper could be a piece of wood or metal set about ⅜ in. from the belt just under the roll at the dump end of the conveyor. The house end of the conveyor could be supported on ropes and pulleys.

Instead of using a bag elevator for feed, I would suggest that you use a bucket elevator similar to the one described in our February issue. Have a small hopper on the first floor where you bring in the feed an elevate it into a bin on the top floor from which it could be spouted to the various houses for feeding.

I believe it would be possible for you to get the equipment you need. You would have to take it up with your County Farm Rationing Board to get a priority. Your biggest difficulty would be with wiring. You might have to find that second hand.

Water Tank Size

▶ **Question:** *How large a tank should we have with an electric pump for a family of five?*

R. W. M., Mo.

▶ **Answer:** Complete electric water systems are usually supplied with pressure tanks of about 40 gallons. This gives enough capacity so the pump will not start and stop too often and yet is not so large that the water will stand for long periods. It also reduces the cost of the outfit and is quite satisfactory where you do not have long service outages. Pressure tanks are very difficult to obtain now during the war period.

If you have in mind using an elevated tank for a gravity supply, then the larger the tank the more reserve capacity you would have. I should say that for your family you should have a tank of, at least, 1,000 gallons capacity.

Where to Get Pulleys and Belts

▶ **Question:** *Can you tell me where I can buy wheels? I am looking for wheels that can put my electric motor to work for me, such as ice-cream freezer, grind stone, food grinder, and small jobs.*

H. H. M., Pa.

▶ **Answer:** You should be able to buy either flat or V pulleys from any concern which has sold shop tools. They are not on the priority list. New Mail Order catalogs still list them.

Motor for Fanning Mill

▶ **Question:** *How big a motor and what size pulleys would I need to run a hand turned fanning mill? The mill has a large gear with 105 teeth which meshes with a smaller gear with 35 teeth. The large gear is turned at 50 to 60 revolutions per minute.* H. R. B., New York

▶ **Answer:** If your fanning mill is the usual farm size, a ¼ hp motor will operate it quite satisfactorily.

To give you approximately the same speed as when turning by hand, you should put an 18 in. pulley on the shaft having the gear with 35 teeth and use a 2 in. pulley on your motor. Or, you could use a 14 or 15 inch pulley on the machine and a 1½ inch pulley on the motor. Your belt will wear out faster and you will be more apt to get slippage with this smaller size pulley.

Fasten a shelf to the framework of the mill to support the motor.

Grain Blowers

▶ **Question:** *Please send me the name of one or more companies that make centrifugal grain blowers.*

C. T. H., Pa.

▶ **Answer:** The following companies make grain blowers:

Link Mfg. Company, Fargo, N. Dakota (5 hp).

The Ramsey Mfg. Company, Columbus, Ohio. (Belt ¾ hp; direct drive ½ hp.)

U. S. Wind Engine & Pump Company, Batavia, Ill. (6 to 8 hp for normal conditions.)

Butler Mfg. Company, Kansas City, Mo., and Minneapolis, Minn. (Blower elevators with and without screw feed; cost $150 to $160.)

Motor Driven Tire Pump

▶ **Question:** *Can you present any idea as to how we on the farm can pump up tires? We have 19 tires and the hand pump pushes hard. I have plenty of air hose but what do you know about the compressor?*

L. D. L., Ill.

▶ **Answer:** Quite a few farmers have rigged up compressors for inflating tires for spray painting and for cleaning machinery by using an old refrigerator or paint spray compressor and a range boiler or small water systems pressure tank as an air pressure tank.

New tanks and new compressors are not easy to find now during the war. Unless you can find a local dealer who has them, you would probably need a priority to make the purchase. You can frequently, however, find such equipment in the stock of second hand machinery dealers or even junk yards. Compressors from old style large electric refrigerators are quite satisfactory.

Motor and Jack for 175-Foot Well

▶ **Question:** *Please send me information on the size of pump jack and motor for a 175-foot well.*

A. D., Wis.

▶ **Answer:** For a pump delivering 300 gallons per hour from a depth of 175 ft. you will need a 1 hp motor. Pump jacks are rated in maximum horsepower, so the jack should be good for at least 1 hp. For a lift

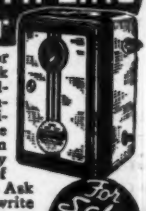
CLEAN-EASY MILKERS

NOW WITH MODERN WOOD CONSTRUCTION

Write for FREE FOLDERS *in color!*

Now, illustrated circulars just off the press will give you complete information about the new Clean-Easy Milker...facts about the modern wood construction... about the "swinging pump" action...about the new valve spring...about low vacuum, fast milking, easy cleaning, gasoline or electric power, portable and truck models! Get ALL the facts about Clean-Easy Milkers! Write the Ben H. Anderson Mfg. Co., Madison, Wis., Dept. 31

Get A Gardner Hi-Line Controller



Save time, get set for more milk, beef or pork production with a Gardner hi-shock hi-line controller — the best engineered electric fence unit. Thousands are in nation-wide use, many have given six years of successful service. Ask your dealer today, or write direct for free folder.

For Sale Now!

Gardner Mfg. Co.
5353 Kansas St. Horicon, Wis.

from that depth, it is desirable to have a sturdy jack made with as nearly a straight line lift as possible. A deep well working head would, of course, be better unless you already have the pump. All of the well-known pump companies make this equipment.

National Electric Code

▶ **Question:** *How may I obtain a copy of the National Electric Code?* J. S., Ky.

▶ **Answer:** You can obtain a copy of the National Electrical Code from the National Board of Fire Underwriters, 222 West Adams Street, Chicago, Illinois. The price is 10c.

Milker Timer

▶ **Question:** *I was much interested in "Timed Milking" in your March issue. Could you tell me where I could get such a timing device?* N. W. F., Pa.

▶ **Answer:** A milk timing device to be hung around the operator's neck has been placed on the market by the E. J. Gengler Mfg. Co., Brown Deer Road, Station F, Milwaukee, Wis.

Motor Driven Churn

▶ **Question:** *Can I still buy a ¼ hp motor driven churn? Or just the motor?* E. W. Y., Maine

Answer: Motor driven churns are on the Government's prohibited list for the duration. Unless you can find one in a local dealer's hands there is not much hope. Fractional horsepower motors can be purchased without a priority if you can find a dealer who has one. If he must order it from a manufacturer you will need a preference rating of AA-5 or better.

Yard Light Works Loose

▶ **Question:** *The wind works the bulb loose in the socket on a yard light that I have. How can I prevent it?* E. H. L., Ind.

▶ **Answer:** To keep your bulb from working loose try wrapping a couple of layers of friction tape around the end of the socket and overlapping the lamp about one-quarter of an inch. Pull it up snug and I think it will hold.

It might be that a new socket would hold the lamp without any tape.

Grounded Return to Save Wire

▶ **Question:** *I have enough No. 8 wire to run one line from the service panel of my residence to a tenant house three hundred fifty feet distant. Could I obtain sufficient and safe service for lights and household appliances by using this No. 8 wire for a "hot" line to the tenant house and connecting the tenant house circuit to an artificial ground? There will be no neutral wire running back to the service panel of my residence.* J. S., Ky.

▶ **Answer:** Grounded returns have been used on some lines but they often produce trouble on telephone circuits and may give poor service during dry periods unless you have a perfect ground down to moisture.

It is quite probable that your power company has some regulations regarding circuits and I would suggest that you get in touch with your rural service man before making this installation. It might be that it could be done during this emergency when wire is hard to get.

Milk Standardizer

▶ **Question:** *Could you give me any information about milk standardizing equipment? Where can I get it? How much would a small unit cost? Are they practical? Are they available now?* A. R. G., New York

▶ **Answer:** Milk standardizers for use on farms are cream separators, so designed that adjustments can be made in the cream screw to give the desired butter fat content. They do the work quite satisfactorily.

An electric separator of this type would probably cost around $100. A limited number of separators are available.

32 V. D.C. Motors on 110 V. A.C.

▶ **Question:** *I have several 32 volt D.C. motors. I would like to know if there is any way possible for me to use them on 110 volts A.C.* Mrs. J. W. O., Va.

▶ **Answer:** I am sorry to tell you that there is no way to use your 32 volt D.C. motors on 110 volt alternating current without completely rebuilding the motors, which would probably be just as costly and difficult as to buy new A.C. motors.

Repairs to Range Enamel

▶ **Question:** *I had the misfortune of knocking off some of the enamel about the size of a quarter-dollar from the corner of my range. Is there some kind of enamel or leather that could be cemented on?* Mrs. M. A., New Jersey

▶ **Answer:** Several companies make special porcelain glaze for repair-

Available for Vital Needs on Farms

NEW F&W MULTI-STAGE EJECTOR PUMP

● IMPROVED performance on lifts 20 to 120 feet are provided by this new F&W centrifugal pump. May be installed directly over well, or in basement, connected by horizontal piping outside. Completely automatic, including exclusive new control valve which requires no manual setting or adjustment.

Other F&W ejector pumps for medium deep and shallow wells, afford complete selection for each individual need. Advanced engineering, simplified design assure quiet, dependable operation. Compact units, deliver more water. Write now for free literature on the complete F&W line—no obligation.

F&W WATER SYSTEMS

The "Bullet" for shallow wells, streamlined, efficient, dependable.

FLINT & WALLING MFG. CO., INC.

595 OAK ST. KENDALLVILLE, IND.

ing chipped spots. Tilette Liquid Porcelain Glaze is available through Woolworth Stores, Sherwin-Williams Paint dealers, Sears-Roebuck and retail hardware stores. Or send 25c to Tilette Cement Co., Inc., 401 Lafayette St., New York City, for a 1 oz. bottle. Clean the spot thoroughly, sand it, brush or wipe on several coats of glaze, sanding smooth after each coat. Not as good as baked porcelain and will not stand high temperatures, but it makes a pretty good job on most appliances. Can be tinted to match cream colored enamel.

110 V Appliances on 32 v Circuit

▶ **Question:** *I want to connect a 110 volt iron and refrigerator to our 32 volt direct current. Can I get a 32 volt converter now?*

S. C., DeL., N. C.

▶ **Answer:** A motor generator set to change 32 volt current to 110 volt would cost you, at least, $100.00, and I very seriously doubt whether you would be able to buy one during the war. This is special equipment and could only be purchased on a high priority rating. It would be much easier and cheaper for you to purchase a 32 volt iron or possibly you could exchange with someone who needs a 110 volt iron. I wouldn't be surprised that you could effect a similar exchange for your refrigerator. Why don't you try putting an ad in the local paper?

Homemade Electric Welder

▶ **Question:** *Where can I get plans for making an electric welder out of a 200 ampere generator?*

A. H. P., New York

▶ **Answer:** I do not know where you could get plans for working over a 200 amp. generator. I assume your generator is a 220 volt or 110 volt machine which would be probably four times as large as necessary for most any welder which is commonly used. The rebuilding job would not be easy since a welder generator takes an entirely different winding from the ordinary electric generator. The best advice I can give you would be to talk it over with your Power Company rural service man.

Protect Your Motor

. . . . . (Here from page 11)

comes up; in other types the switch must be reset by hand.

Overload protection for a motor is no substitute for oil or care. It does, however, protect the motor from carelessness, neglect and abuse by cutting off the current when something is wrong and before the motor is seriously injured. That is important, especially now when new and used motors are becoming increasingly difficult to get and motor repairmen have gone into defense plants. If you do not want to milk or pump by hand or lose the use of your chore motor, take care of it and give it protection.

A magnetic motor starting switch. The switch is opened and closed quickly by an electro-magnet which in turn is controlled by a push-button and by the overload device. The quick-opening reduces arcing, which makes it desirable for larger motors. The push button control may be located on the cover as shown here or may be at the end of an extension cord 30 ft. or more away. The switch has thermal overload protection and some also have a special device to open the circuit when the voltage falls to a predetermined point.

Electric Fly Screens and Traps

Reinstall them now, before the first flies appear! Be ready to electrocute the early breeders responsible for that bad fly condition in the summer!

Enjoy maximum efficiency by keeping the screens free from dust! If the frames need repainting, do not paint the porcelain insulators!

If you are in need of additional screens, it is necessary to obtain a priority. Use a PD-1A form.

New Publications

(Publications are obtainable from the addresses given in the description. Some states make small charges for bulletins sent outside the state.)

• DEHYDRATION OF FRUITS AND VEGETABLES AND UTILIZATION OF DEHYDRATED PRODUCTS. Bul. 225, Georgia Experiment Station, Experiment, Ga. 35 pp, illus. Preparation of fruits and vegetables, drying, packaging and cooking. A new bulletin on home and commercial dehydration with pictures of several large and small driers.

• DEHYDRATION OF FRUITS AND VEGETABLES IN THE HOME. Exp. Sta. Bul. 183, University of Tennessee, Knoxville, Tenn. Plans and descriptions of several sizes of home electric dehydrators. Selection, preparation, dehydration, packaging refreshing and nutritive value of dried fruits and vegetables. Effect of drying on vitamins. Contains an excellent table of directions for preparation, temperature and time of drying and judging dryness. 21 pp, illus.

• HOW TO GET MORE LIGHT FOR YOUR MONEY. An excellently illustrated 16-page booklet with many suggestions on making the best use of your lighting. Repairing cords, replacing plugs, changing fuses. Price 2c, Westinghouse Co., Bloomfield, N. J., or from Westinghouse Lamp Dealers.

• WARTIME IRON WIRE POULTRY BROODERS. Ag. Exp. Sta. Pop. Bul. 169, Washington State College, Pullman, Wash. 15 p, illus. Plans for building a homemade brooder using iron wire for a heating element.

• MAINTENANCE OF FARM IMPLEMENTS BY ARC WELDING. Bul. 433, Lincoln Electric Co., Cleveland, O. 10 p, illus. Building up plow surfaces and points, sprockets and worn parts. Repairs of broken machinery and altering equipment. Free.

CLASSIFIED ADVERTISING

ELECTRICITY WITH THE LYON LINE can increase your production. However, conditions prevent prompt deliveries of some items at present. Repairs and certain parts for homemade brooders are receiving special attention. Literature on electric poultry supplies is available. LYON RURAL ELECTRIC COMPANY, Dept. EF, Greensboro, N. C. or San Diego, California.

How to Get Service & Equipment

Changes Since Our April Issue Was Printed (See April, page 3)

ELECTRICAL CONNECTIONS

WPB Order U-1-c has been changed making it necessary to have only five animal units on a farm to get service instead of ten.

MACHINERY

WPB Order L-170. There has been much talk of more machinery for farms. Very little material has actually been made available to manufacturers as this is written April 9.

Some large manufacturers—Class A and B—that have had O quotas have been given permission to build some equipment to use up materials and parts on hand. It applies to some pump manufacturers, dairy equipment manufacturers and others.

Some materials are being made available to manufacturers for building small home dehydrators.

The Farm Machinery Branch of WPB has been reorganized during the past month.

POULTRY NETTING; FENCE

WPB Order L-211 grants permission to manufacture a wide variety of poultry netting. Previously was restricted to few kinds.

Under Rationing Order 3 it is no longer necessary to have a Purchase Certificate to buy fence or barbed wire.

REFRIGERATORS

WLB in a supplement to Order L-5-d on March 27 released 148,847 mechanical refrigerators for sale to civilians. These are mostly 7 cu. ft. boxes many of them DeLuxe models. Each purchaser must attest on a government form supplied by the dealer that he has no other domestic mechanical refrigerator or any other refrigeration equipment he can use. Some of these may be available, but probably most of them have been sold.

FREEZERS AND COMPRESSORS

WPB Order L-38 as revised March 27 stopped the manufacture of all farm freezers and frozen food cabinets of all sizes. At the same time it released for unrestricted sale any such cabinets now in stock. (We do not know where there is one.)

Refrigeration compressors and equipment may be obtained for dairy products and food processing and storing under certain conditions. AA-4 priorities are necessary. Application should be made on the new form PD-831 instead of PD-1A.

SOME TIPS

If you need something badly you had better take plenty of time to answer *all of the questions* on the PD-1A or PD-831 forms. Answer fully. Give explanations. You will have to do it in the end; and you'll save time doing it in the beginning.

Get as high a preference rating as you can. The rules may require only an A-9 rating, but if there are a hundred A-5 orders ahead of yours, you may have to wait.

When you send your order and priority to your dealer write another little note telling him just why and when you need the item. "Take your hair down" and be specific. It helps.

Last Call!

SPRING SCRAP DRIVE

Turn in your scrap metal before haying.

The boys need it.

They're "making hay" over there.

★

WAR PRODUCTION CONTEST

SUBJECT: *How a Milking Machine is Helping Us in Milk Production*

Explanation of Contest: As in previous contests we want your own experience with a milking machine — facts and figures on extra milk produced, time and labor saved, herds saved from sale, costs and returns. Write it as if you were telling some other interested dairyman the facts he would like to know.

First Prize: A $25 War Bond.

Second Prize: $5 in War Stamps.

Five Prizes: Each $3 in War Stamps.

We will also pay $1 each in war stamps for any other entry published.

In addition $1 to $3 in war stamps will be paid for each photograph or sketch illustrating your statement, which we can use.

Winners will be announced in the July issue.

In case of a tie each winning contestant will receive the full prize to which he is entitled.

All members of the family may enter the contest, but each may submit only one statement.

The decision of the judges is final, and all entries become the property of this magazine.

Send your letter on a plain piece of paper, letterhead or postal card.

Mail entries to Wartime Contest Editor, ELECTRICITY ON THE FARM, 24 W. 40th Street, New York City. They must be postmarked **before** June 1.

★

Winners of the March Contest are announced elsewhere in this issue.

There's no *Forty-hour Week* on the farm!

MOTHER NATURE won't wait on the time clock. Producing foodstuffs for a nation at war is a dawn-to-dusk task and farmers need all the help they can get.

That's why so many of them are making full use of their electric service these days. They have found that on many jobs their motorized farm equipment saves hours of precious time . . . helps them keep production up despite the scarcity of farm help.

On the farm, as in the factory, electricity serves the cause of victory.

YOUR ELECTRIC COMPANY

ELECTRICITY ON THE FARM
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New York, N. Y.

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